

ETHOLOGICAL REMARKS ON SOME NEW ENGLAND WATER-STRIDERS (HEMIPTERA).

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The college pond at Northampton is narrow and winding, perhaps a mile long, formed by a dam thrown across a small and rocky stream. For the most part its insect population is very meager, due no doubt to an extreme lack of aquatic vegetation, but at the upper end, where the stream forms boulder-strewn rapids as it enters the pond, there is a numerous population of aquatic Hemiptera, an association of water-striders which, as I have observed on other occasions as well, seems characteristic of such an environment. Investigating this company of navigators on August 22, 1919, I found the following species represented: of the Gerridæ—*Gerris conformis* Uhl., *Metrobates hesperius* Uhl., *Trepobates pictus* H.-S., and *Rheumatobates rileyi* Bergr.; of the Veliidæ—*Rhagovelia obesa* Uhl.

These species are entirely confined to the surface, except the last mentioned, which dives occasionally; and they are quite independent of aquatic vegetation, since for their prey they depend very largely upon terrestrial insects which chance to fall into the water and are borne down by the current. On the occasion under consideration the individuals of *Gerris conformis* remained for the most part in schools under the shelter of the bank, while those of *Rhagovelia obesa*, nymphs of perhaps the fourth instar, formed a small, compact swarm in the eddy behind a boulder. The other species were to be found scattered more at large over the surface; but farther down, where the water becomes quiet, all were entirely absent. Thus it appears that under certain circumstances these species affect running water by preference, although some of them, members of the Halobatinae, may often be found on bodies of water quite lacking in current, as stated by de la Torre Bueno.¹ In order to maintain their position near the foot of the rapids, these insects ordinarily row in leisurely fashion against the current, thus exhibiting like many other fluviate animals what has been called

¹ Gerrids of the Atlantic States. *Trans. Am. Ent. Soc.*, Vol. 37, 1911, p. 243.

a positive rheotropism, but this habit is by no means the manifestation of a fixed and mechanical reflex, since on occasion they turn and with the same facility move down the stream or across it, in pursuit of prey or away from enemies, or with purposes less clear to the observer.

Among these water-striders may be found most striking examples of pterygo-polymorphism, or diverse wing development among individuals of a single species. *Gerris conformis* is always macropterous in this region, while a near relative, *G. remigis* Say, also found as a rule on running water, is usually but not always apterous. Of *G. marginatus* Say, generally macropterous, more rarely apterous, there are often found examples having wings of one half the normal length, as well as various intermediate conditions, and in *G. canaliculatus* Say both macropterous and apterous forms occur frequently, the one sometimes developing from eggs produced by the other, as de la Torre Bueno has shown.² *M. hesperius*, *T. pictus*, *R. rileyi*, and *R. obesa* are usually found in the apterous condition in the north, but winged individuals of all these species may be occasionally met with. Among thousands of examples of *R. rileyi* recently examined at Cold Spring Harbor, L. I., but one was macropterous, the rest quite apterous. Reuter³ and de la Torre Bueno⁴ have offered speculations, notably lacking in experimental evidence, on the subject, but an adequate explanation of the phenomenon is yet to be made and the problem is certain to repay investigation by modern methods, since even the genetic behavior of the forms, quite possibly Mendelian, is almost entirely unknown. These insects, especially the species of *Gerris*, can be bred successfully in captivity by following the methods developed by de la Torre Bueno.⁵

The occurrence here of the species enumerated above is of some distributional interest, since none of them, excepting *Gerris*

² Op. cit., p. 248.

³ Polymorphisme des Hémiptères. Bull. Soc. Ent. France, 1875, pp. 225-236.

⁴ Life history and habits of the margined water strider, *Gerris marginatus* Say. Ent. News, Vol. 28, 1917, p. 297.

⁵ Notes on collecting, preserving and rearing aquatic Hemiptera. Can. Ent., Vol. 37, 1905, pp. 137-142.

conformis, have hitherto been reported from western Massachusetts. *Rheumatobates rileyi*, remarkable for its extreme sexual dimorphism, is a notable addition to the New England fauna, and this is the most northern point in its known distribution, if we except the doubtful Quebec record⁶ of an immature example found by de la Torre Bueno among the specimens described as *Halobatopsis béginii* by Ashmead. In response to my request for information regarding the labels attached to these specimens, which are preserved in the National Museum, Mr. Gibson most kindly sent them for examination and I find no reason to suppose that the example of *R. rileyi* came from Canada. One pin holds four nymphs of *Metrobates hesperius*, the other a nymph of the same species and one of *R. rileyi* and both bear hand written labels—"Nj. 27-7-96"—which I take to refer to New Jersey. Another specimen from this series, which I have not seen, bears the label "Sherbrooke, Can.," as described by de la Torre Bueno,⁷ but this is *M. hesperius*, and moreover it is only to this that the original description refers or applies. To the immature examples of *M. hesperius* sent from Canada by the Abbé Bégin and described by Ashmead⁸ as *Halobatopsis béginii*, it is evident that there have been added, probably by Ashmead himself, other materials from other localities, including the specimen of *R. rileyi*, under the impression, of course, that they were all conspecific. Only the specimen or specimens labeled "Sherbrooke, Can.," can be regarded as type material of Ashmead's unfortunate creation, and hence the citation⁹ of *H. béginii* as a synonym (in part) of *R. rileyi* would seem hardly justifiable.

But to return to our association of water-striders. Visiting the rapids again on September 29 with a class, we found three of the species still active, though in reduced numbers, represented by both adults and nymphs, but *Gerris conformis* and *Rhagovelia obesa* had quite disappeared. Very likely these are of more delicate constitution than the others and had been led to seek winter

⁶ Gerrids of the Atlantic States, *l. c.*, p. 251.

⁷ On *Halobatopsis béginii* Ashm. Can. Ent., 1911, Vol. 43, pp. 226-228.

⁸ A new water-bug from Canada. Can. Ent., 1897, Vol. 29, p. 56.

⁹ Van Duzee's Catalogue, p. 431, doubtless following de la Torre Bueno, *op. cit.*, p. 228.

quarters by the recent cold and rainy weather, though the particular day referred to was bright and warm. Next spring we shall try to determine the time at which these species first appear, and then the data of occurrence may be more fully summarized.

NOTES ON THE HEIDEMANN COLLECTION OF HETEROPTERA NOW AT CORNELL UNIVERSITY.

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While on a visit at Cornell University in the summer of 1919, through the courtesy of Dr. J. C. Bradley, I was able to go over the Heidemann collection of Heteroptera, purchased by the University after his death. These few notes refer to those facts which could be determined without prolonged study and comparisons.

Oncozygia clavicornis Stål. The collection contains two specimens of this very rare species, one from Fortress Monroe, Va., April 19; and the other from Ashby, Fla. The latter is an addition to its distribution, it being known only from Texas and Virginia.

Teleonemia slossoni Heid. Type. The specimen so marked is a short-winged *Alveotingis grossocerata* O. & D., from Franconia, N. H., taken by Mrs. Slosson; 2 short-winged, with perfect antennæ, are from Delaware Water Gap, Pa., Mrs. Slosson, as is one long-winged specimen. The New Hampshire record is new. I have taken this species in White Plains, N. Y. (heretofore unrecorded from the state) and also a macropterous specimen in beach-washup, at Smith's Point, L. I.

Metatropiphorus belfragei Reut. There are specimens in this collection from Biscayne, Fla.; Virginia Beach, Va.; Cabin John, Md., and Anglesea, N. J. All these except Biscayne, are additional localities; Van Duzee reports it only from Florida and Texas.

Carthasis decoratus Uhler. There are two adults and one nymph from Bladensburg, Md., in the collection.

It is to be hoped that this collection may be gone over and straightened out by competent hands some time in the not too far distant future.